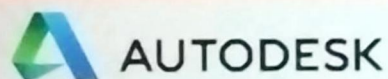




AUTOCAD MECHANICAL



**CENTRAL TOOL ROOM & TRAINING CENTRE
BHUBANESWAR**

SHORT TERM COURSES

COURSE NAME	DURATION
COURSES FOR DIPLOMA/DEGREE IN MECHANICAL ENGG. OR EQUIVALENT	
Auto CAD (Mechanical)	1 Month
CATIA	1 Month
Creo	1 Month
UNIGRAPHICS	1 Month
SOLIDWORKS	1 Month
MASTER CAM	1 Month
CNC Milling & Turning	1 Month
ANSYS (STRUCTURAL & THERMAL)	2 Weeks
ANSYS (CFD)	2 Weeks
HYPERMESH*	2 Weeks
3D Printing	2 Weeks
COURSES FOR DIPLOMA/DEGREE IN ELECTRICAL/ ELECTRONICS ENGG. OR EQUIVALENT	
PLC	1 Month
VLSI	1 Month
SCADA	1 Month
Advanced Embedded System	1 Month
ROBOTICS	1 Month
HYDRAULICS & PNEUMATICS	1 Month
Lab View	1 Month
E.CAD	1 Month
ADVANCE ELECTRONICS*	2 Weeks
POWER ELECTRONICS*	2 Weeks
ELECTRICAL MACHINE LAB	2 Weeks
SURYAMITRA (Solar PV Installation)	1.5 Month
COURSES FOR DIPLOMA/DEGREE IN CIVIL ENGG.	
Auto CAD (Civil)	1 Month
STAAD PRO	1 Month
3Ds Max	1 Month
REVIT	2 Weeks
SURVEY & MATERIAL TESTING*	2 Weeks
COURSES FOR ANY GRADUATE	
Artificial Intelligence & Machine Learning*	2 Weeks
MAT LAB	2 Weeks
Hardware Networking	1 Month
.NET	1 Month
Core JAVA	1 Month
Advanced JAVA	1 Month
Programming in C	1 Month
Programming in C++	1 Month
Internet of Things (IOT)*	2 Weeks
Entrepreneurship Skill Development Program*	2 Weeks
Soft Skill*	1 Month
CCNA	4 Months
SAMSUNG ARISE COURSES FOR +2 SCIENCE/ITI/DIPLOMA/DEGREE STUDENTS	
Hand Held Product (Mobile Repairing)	3 Months
Room Air Conditioner & Home Appliances	4 Months

- All 1 month Course Duration is 96 hrs and 2 Weeks Course Duration is 48 hrs.
- Course fee will be free for SC/ST and Divyang for HHP and RAC&HA Course.
- Course with * mark indication no free exemption for SC/ST candidates.

ALL THE ABOVE COURSES START ON 15TH WORKING DAY OF EVERY MONTH

Training at a Glance:

- Conducted Training Programme from School drop out to B.Tech pass out different level & different discipline students.
- Giving the vocational direction to Youth for Development of Technical Skill
- We also offer various skill development courses for the North East Region Youth under DONOR Programmes of Ministry of MSME.
- CTTC, Bhubaneswar offers IGNOU certified & Hero authorized Hero Mechanic Programme for 8th pass students.
- CTTC, Bhubaneswar in collaboration with Samsung, India offers Advanced Repair & Industrial Skill Enhancement Programmes for various categories.
- We also offer Entrepreneurship Skill Development Programme under ESDP scheme of Govt. of India for skill enhancement in the sectors of CNC, CAD/ CAM, PLC, VLSI etc. for the Trainees of 10th class onwards
- Gainful employment in Hi Tech areas
- Entrepreneurial Skill with Techno - Commercial Knowledge
- Professional Ethics, Work Culture & Personality Development
- Awareness towards the Nation, Society & Environment

Training Achievements:

- Received award of “Excellent Institute in Skill Development Programmes in ODISHA” in 2nd National Odisha Education Summit & Awards 2015
- Represented India in CNC Milling in “World Skill Competition 2015” held at Sao Paulo, Brazil in Aug’2015.
- Best Extension Centre model among all Technology Centre at Rayagada.
- Established CTTC brand in the country for Summer Vacation Training for Degree/Diploma Engineering Graduates.

AutoCAD Application

AutoCAD is a computer-aided drafting software program used for creating blueprints for machinery parts (i.e. Automobile, Aerospace, Ship Building, Machine Tools, Tool & Die making etc.) buildings, bridges and computer chips etc.

AutoCAD is used mainly by Mechanical engineers for design of machineries but Civil engineers are using design of building, bridges, surveying, interior design etc. electrical & electronics engineers using for computer chips, circuit diagram etc.

AutoCAD is also used across a wide range of industries, by architects, project managers, engineers, graphic designers, and other professionals

AutoCAD History

AutoCAD is a commercial software application for 2D and 3D Computer-Aided Design (CAD) and Drafting — available since **1982** as a desktop application of release 1.0 & continue up to release 14.0 in the year of **1997**. From **1999** onwards, new release has been launched by Autodesk as **AutoCAD 2000** to till the current release **AutoCAD 2016**.

Philosophy of AutoCAD

In early days **AutoCAD** was used as a drafting tool, through the years and many releases; it become a design tool with 'Icon' based environment.

AutoCAD screen contains two parts: graphical screen and textual command line.

AutoCAD saves files in .DWG format but can import and export different formats (DXF, IGES)

There are two main domains within an AutoCAD, MODEL space and PAPER space.

All drawing or 'modelling' is done in model space, it is the main 'modelling' area in AutoCAD.

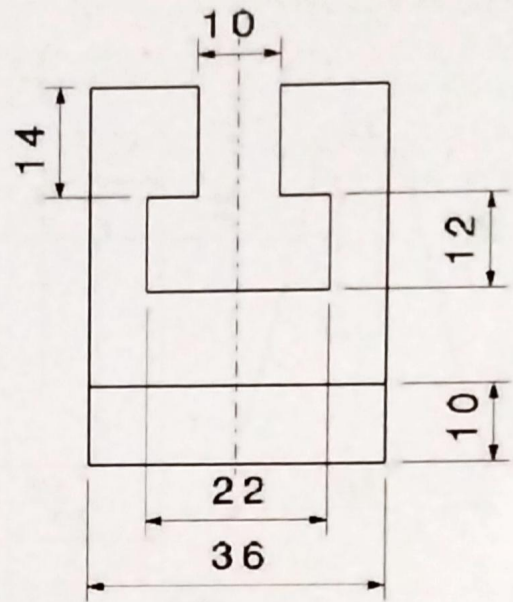
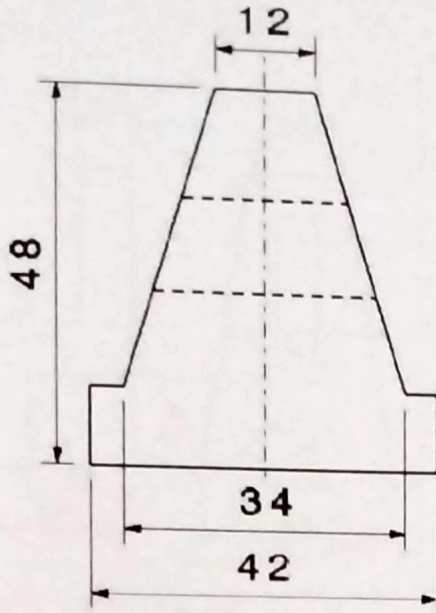
Model (2D) is made in a 'MODEL SPACE' drawings are generated in 'DRAWING SPACE'

PAPER space is an area used to plot (print) the drawing created in the model space.

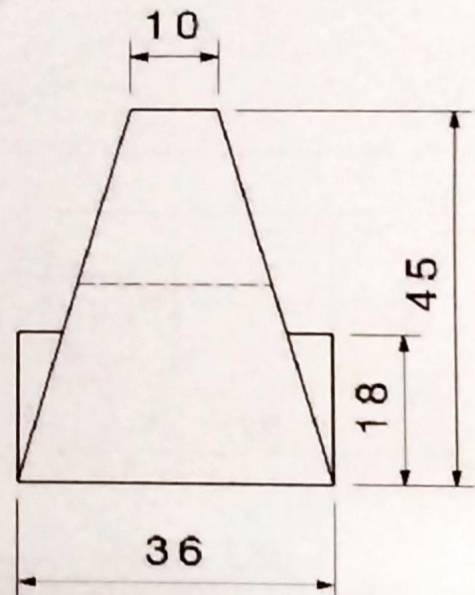
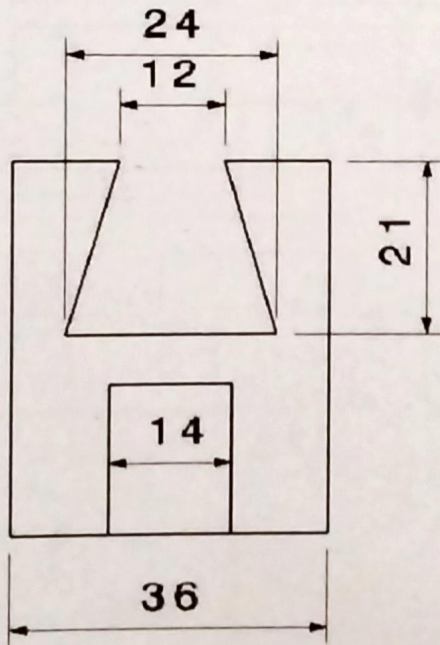
AutoCAD Completely describes given part with as many orthographic projections and cross sections as necessary & with all required dimensions, tolerances and surface finishes.



2D DRAWING



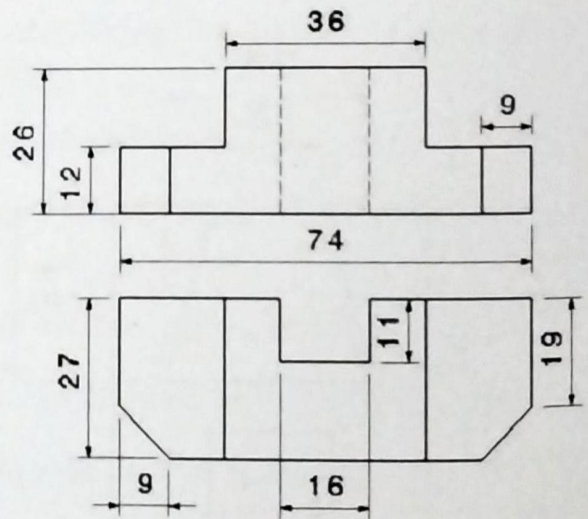
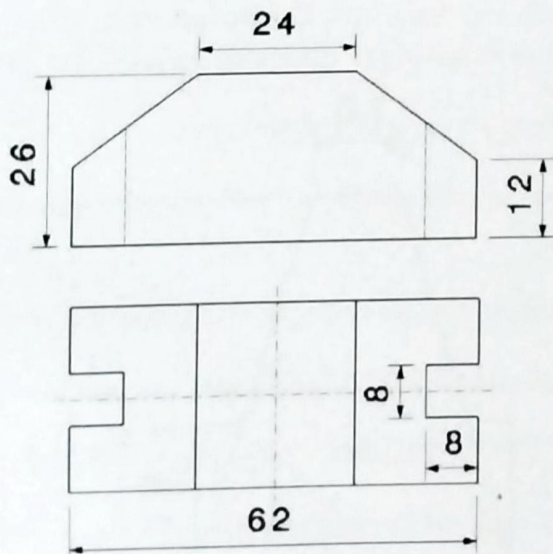
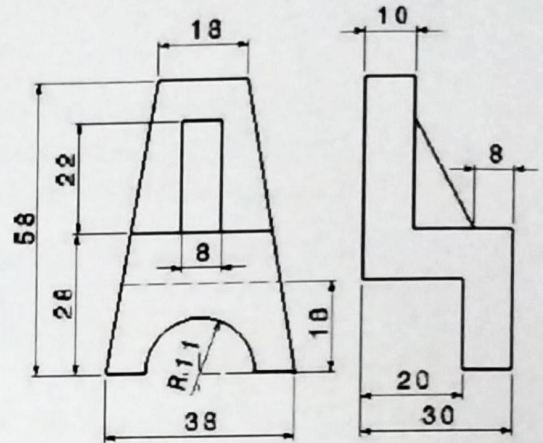
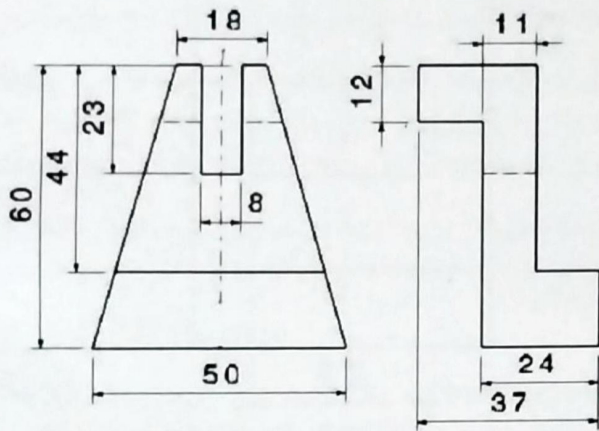
EX 1



EX 2

Options to be used: Line, Mirror, Offset

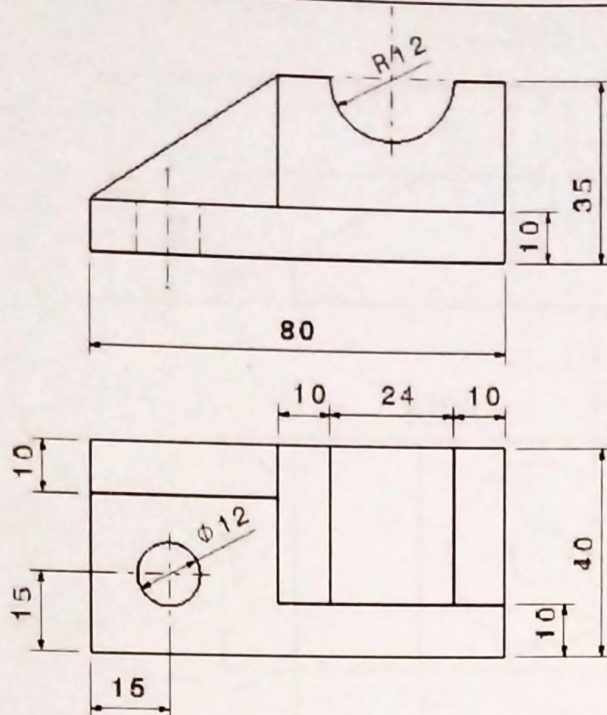
2D DRAWING



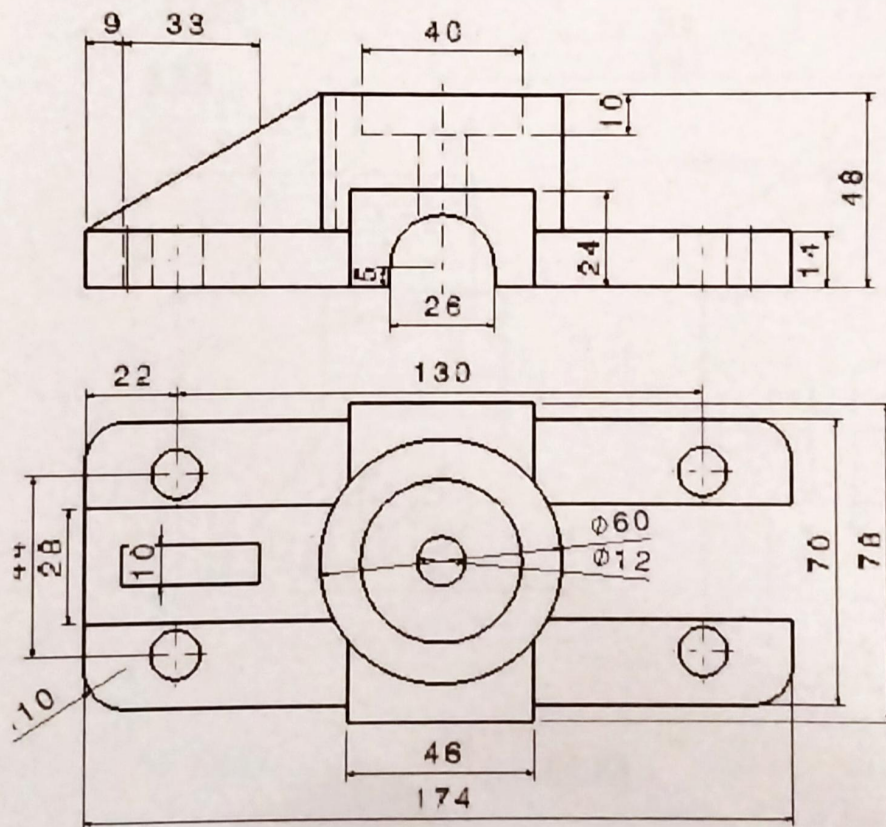
Options to be used: Line, Circle, Trim



2D DRAWING



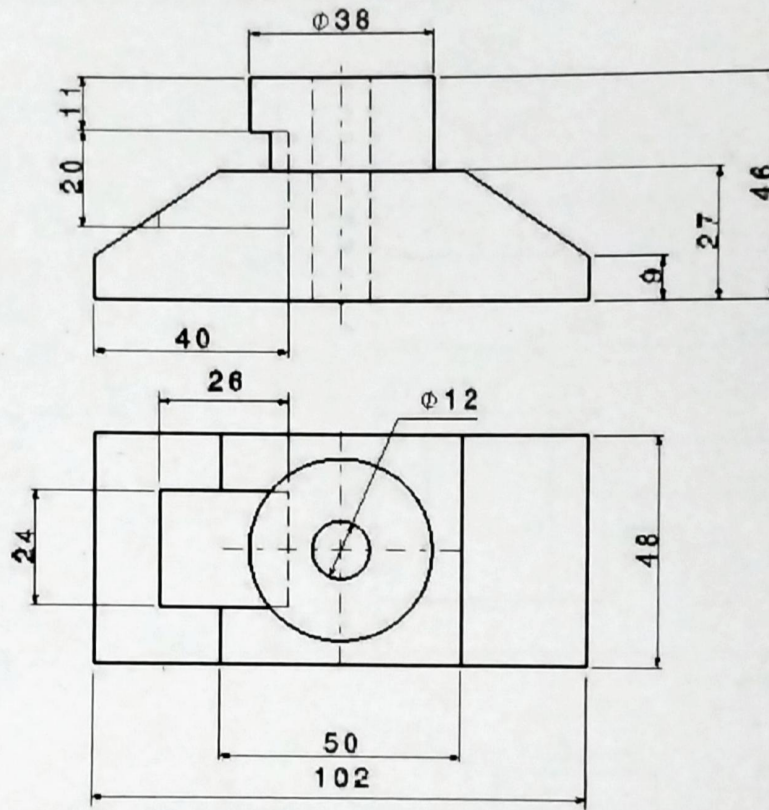
EX 7



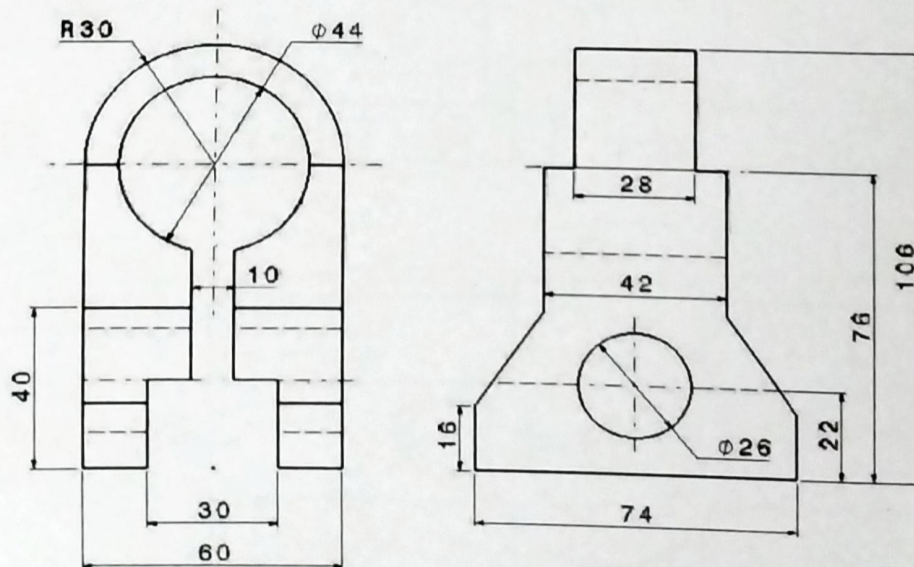
EX 8

Options to be used: Line, Circle, Rectangle, Mirror, Fillet, Trim

2D DRAWING



EX 9

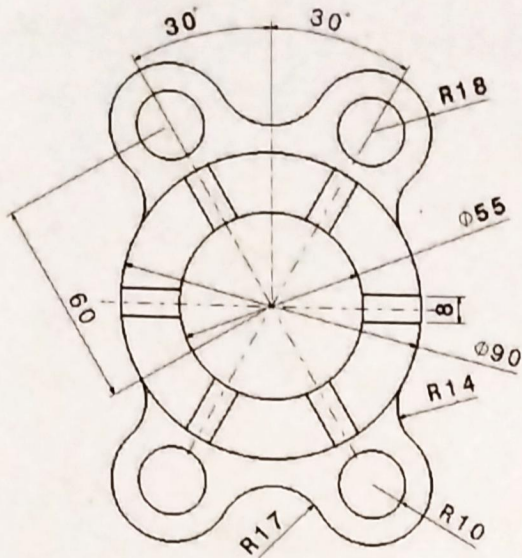


EX 10

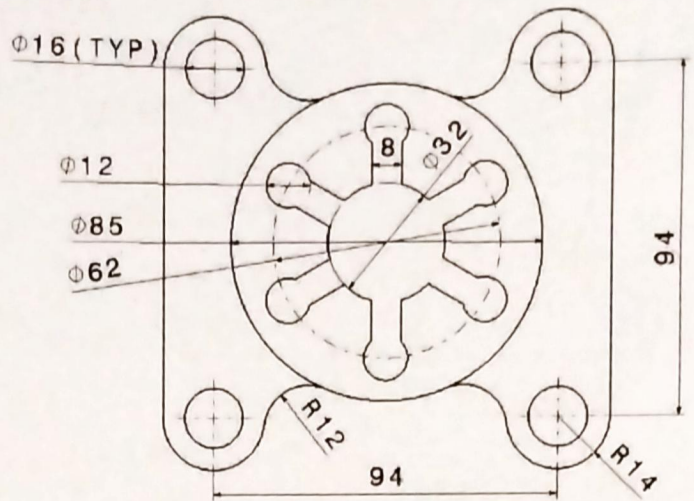
Options to be used: Line, Circle, Rectangle, Trim



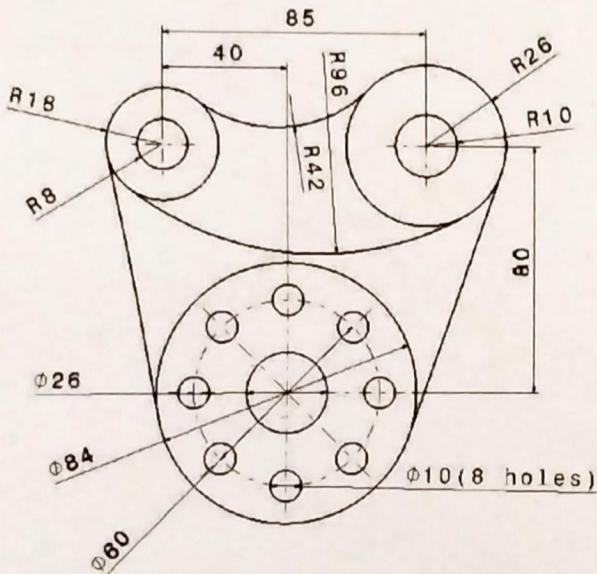
2D DRAWING



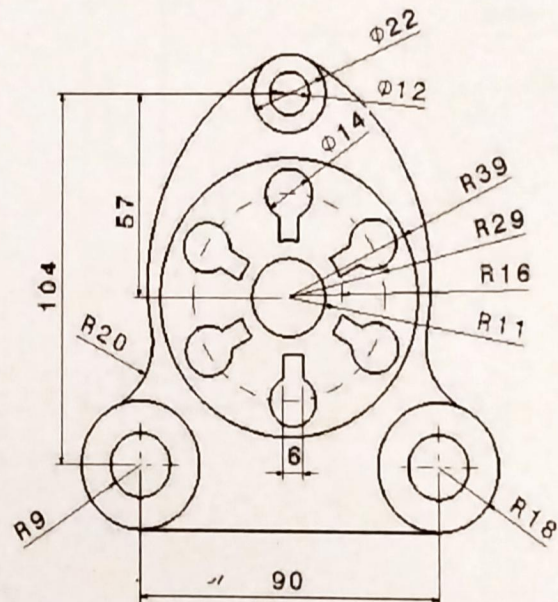
EX 11



EX 12



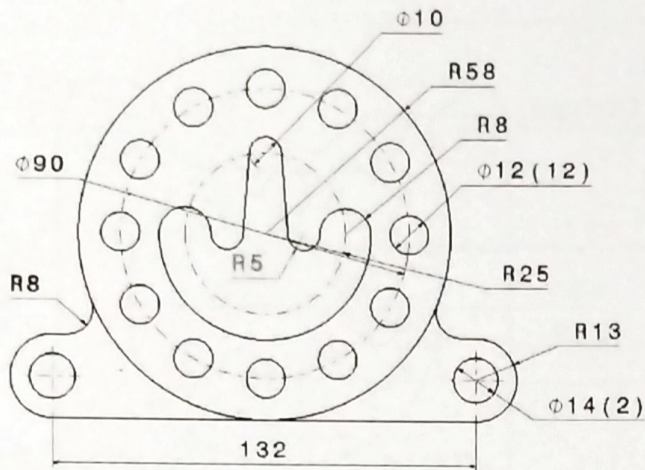
EX 13



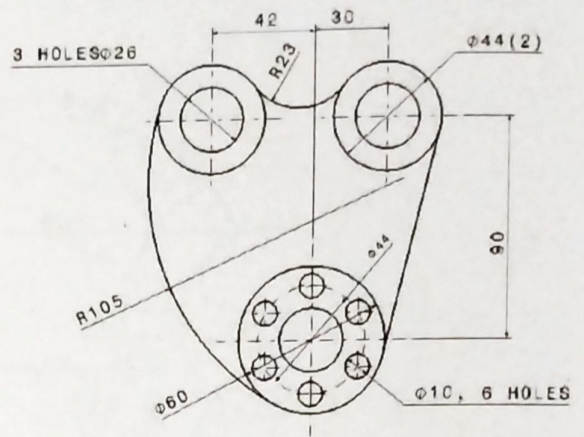
EX 14

Options to be used: Line, Circle, Fillet, Mirror, Trim, Polar Array, Rectangular Array

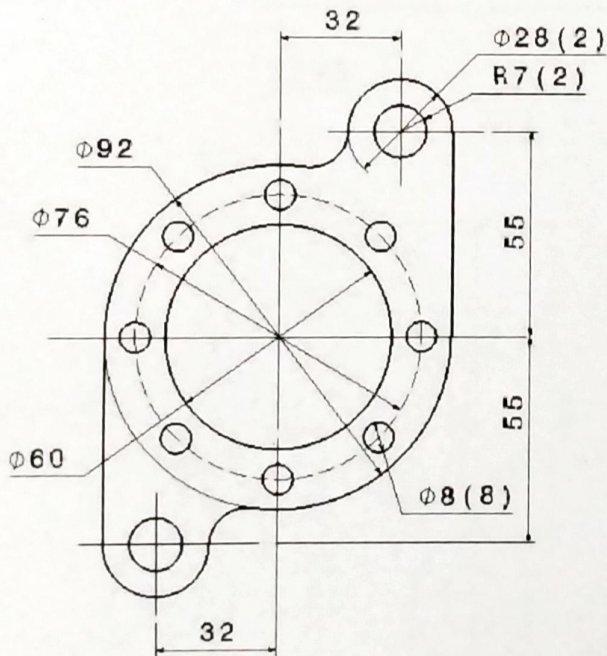
2D DRAWING



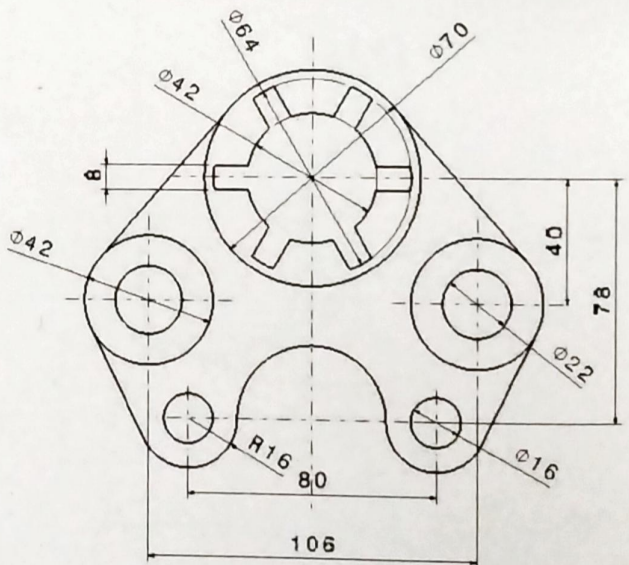
EX 15



EX 16



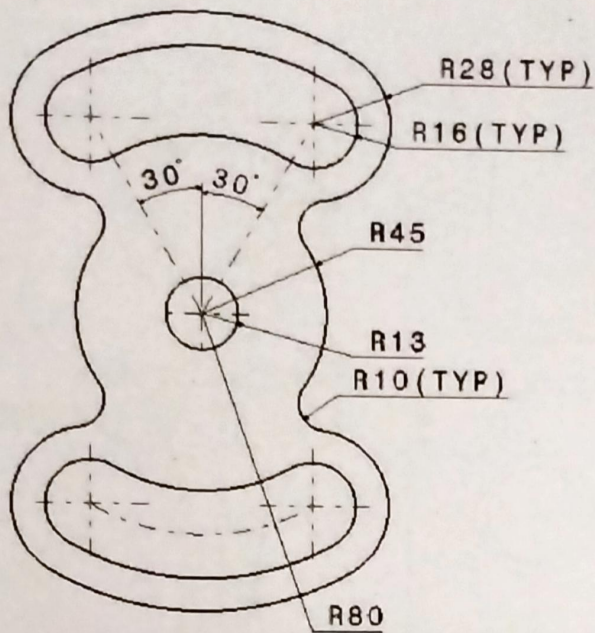
EX 17



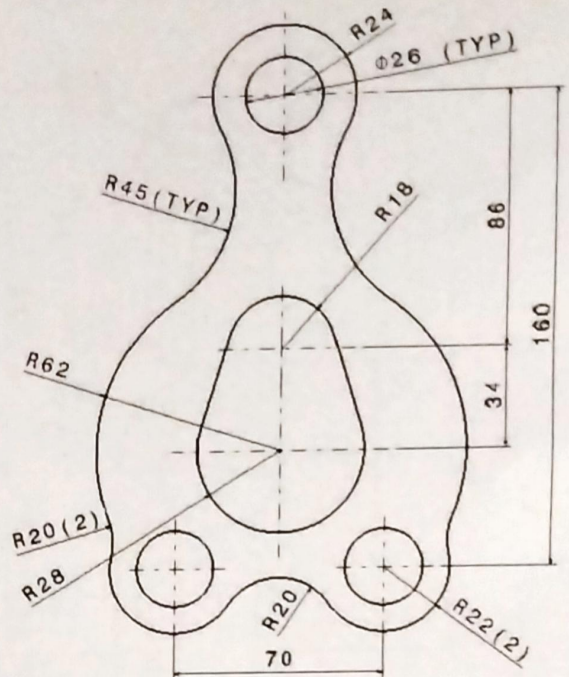
EX 18

Options to be used: Line, Circle, Arc, Fillet, Rectangle, Mirror, Trim, Polar Array

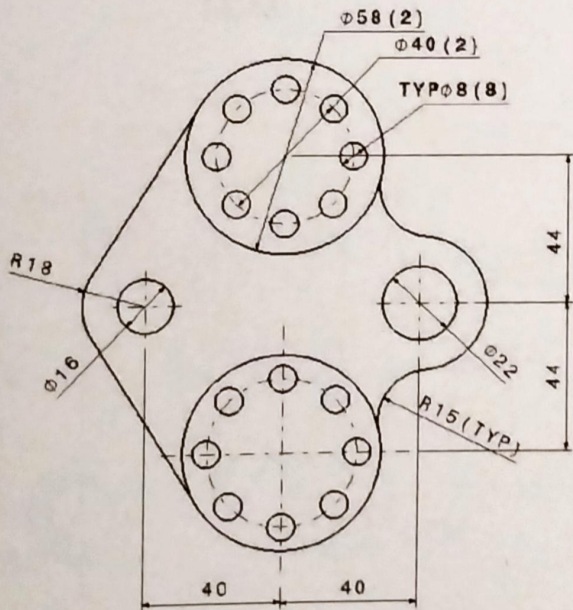
2D DRAWING



EX 19



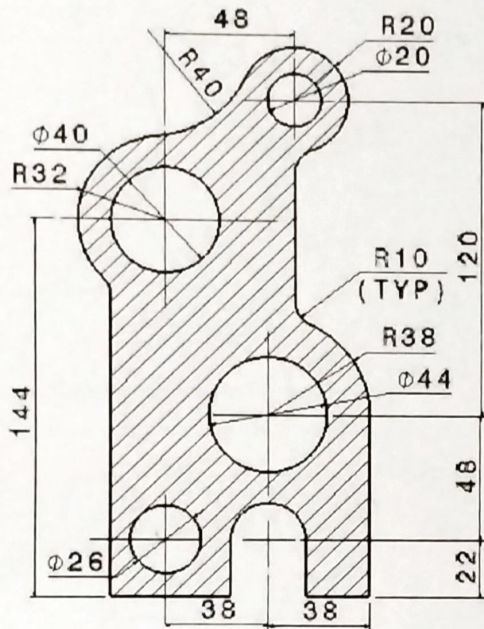
EX 20



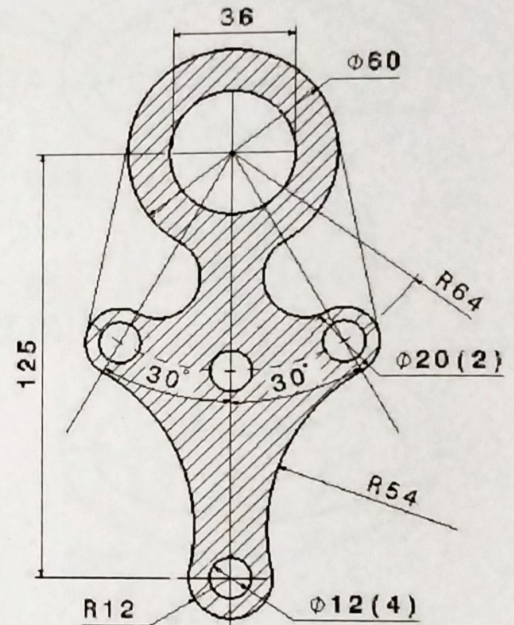
EX 21

Options to be used: Line, Circle, Fillet, Mirror, Trim, Polar Array

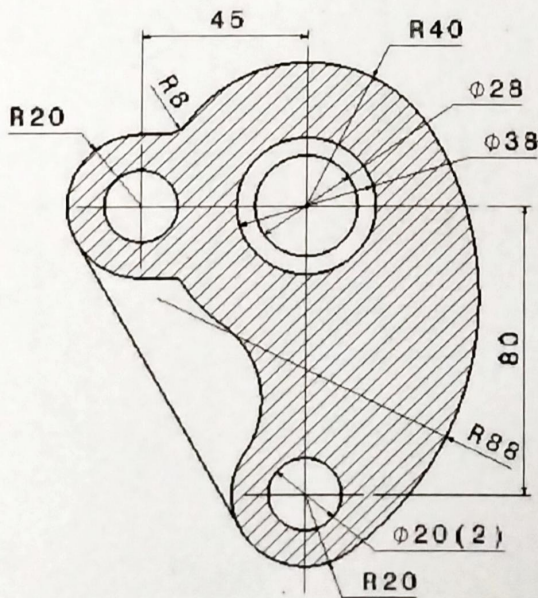
2D DRAWING



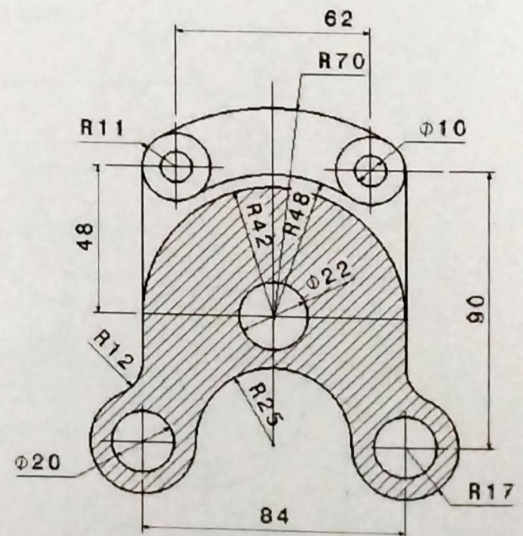
EX 22



EX 23



EX 24

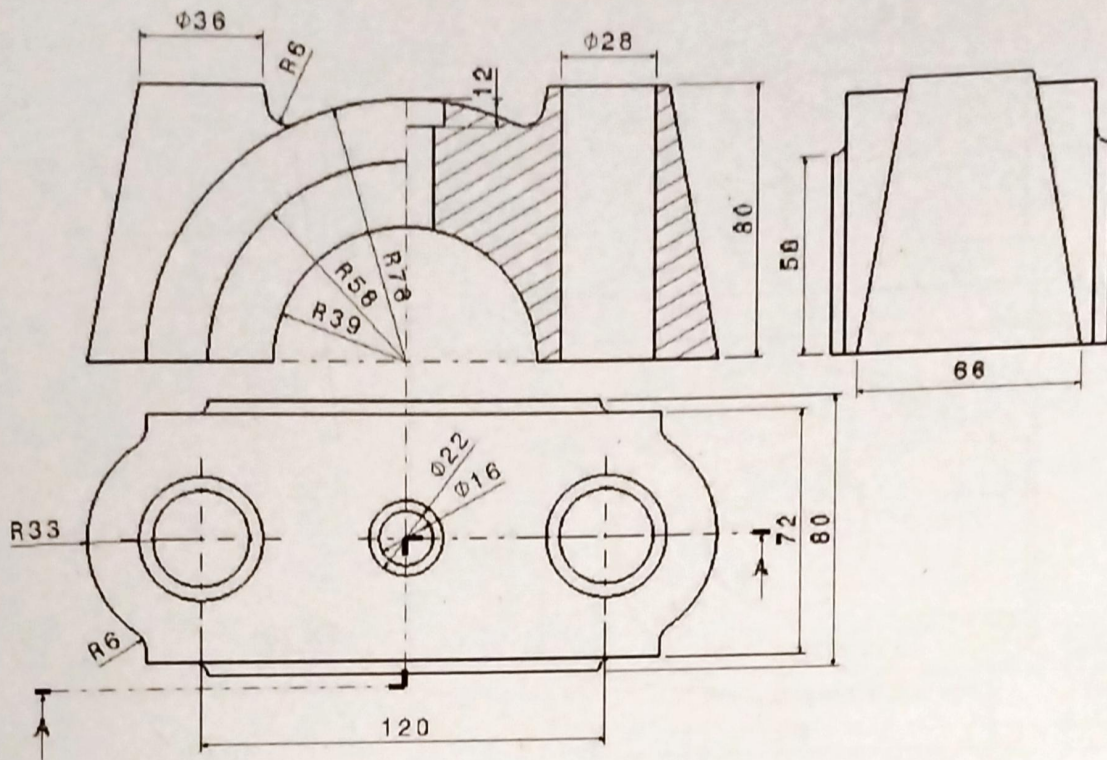


EX 25

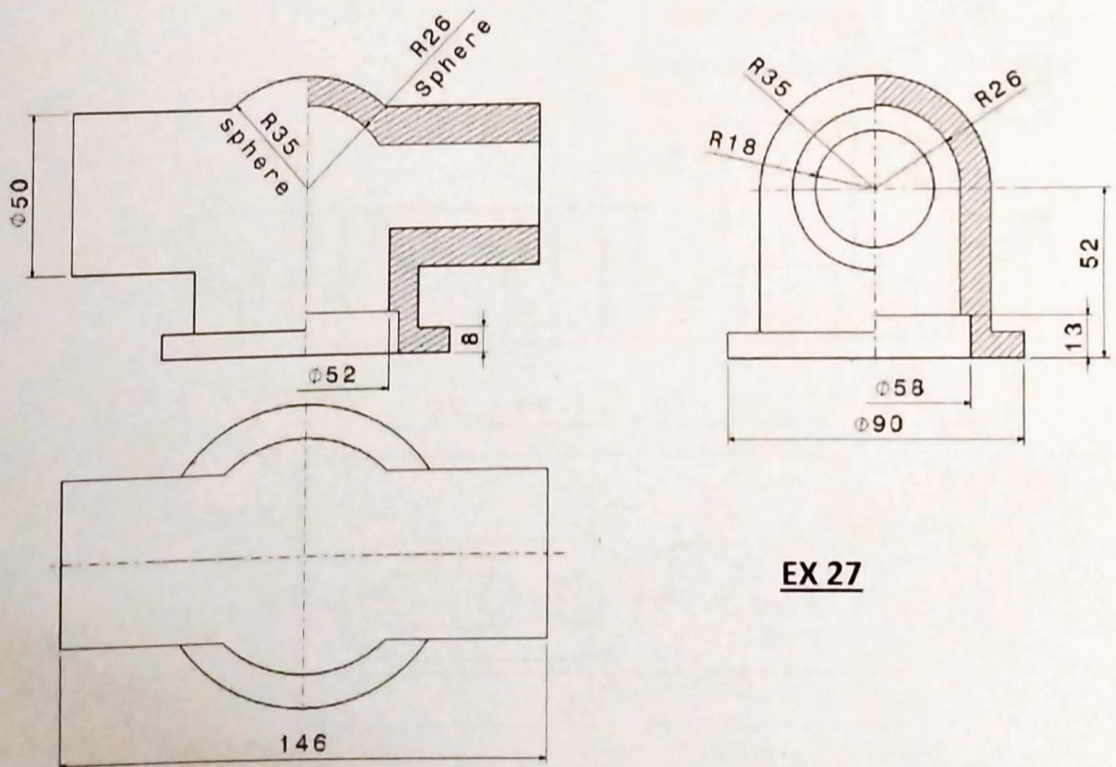
Options to be used: Line, Circle, Fillet, Mirror, Trim, Hatch



2D DRAWING



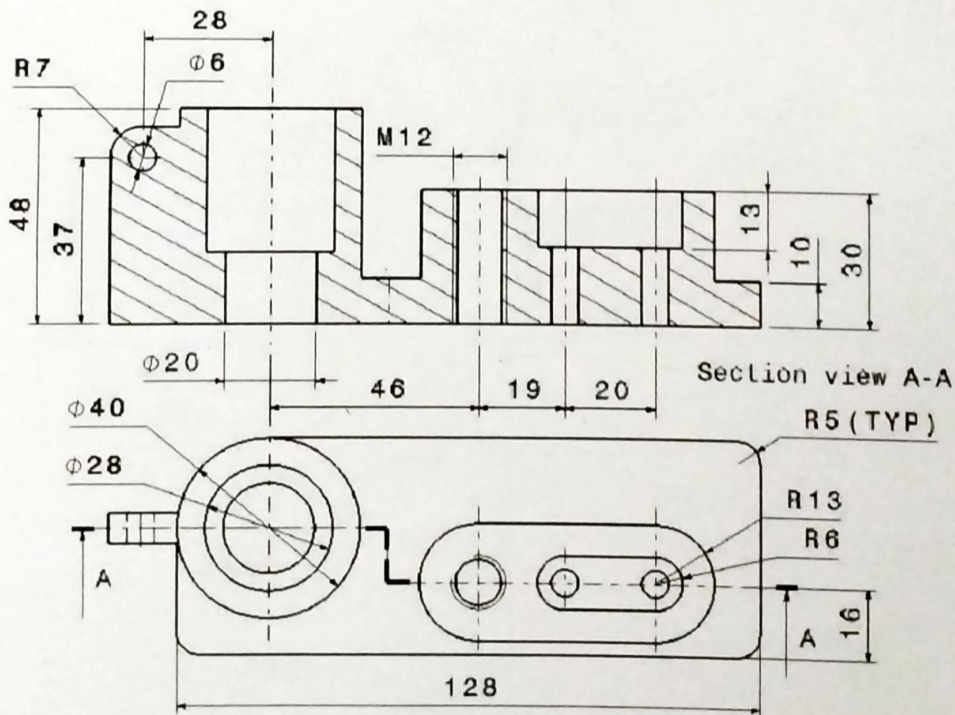
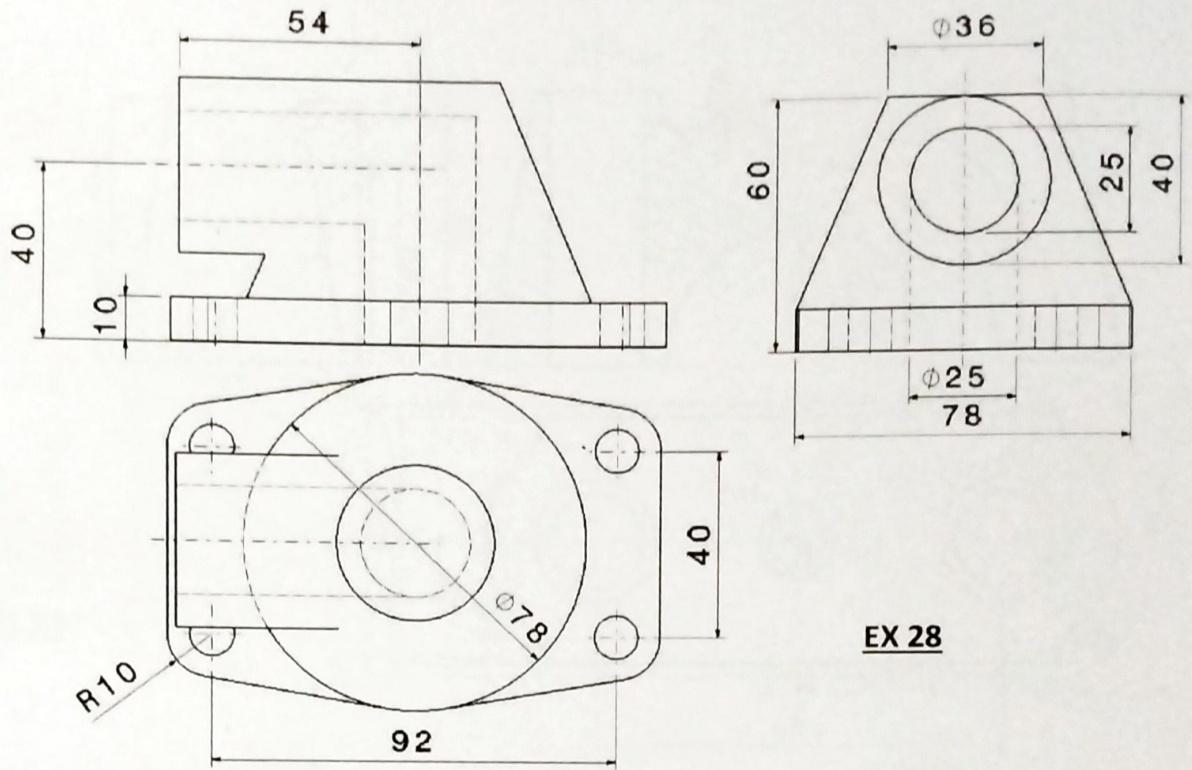
EX 26



EX 27

Options to be used: Line, Circle, Fillet, Mirror, Trim, Offset, Hatch

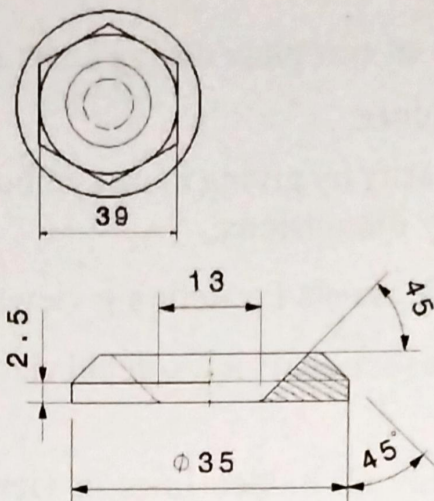
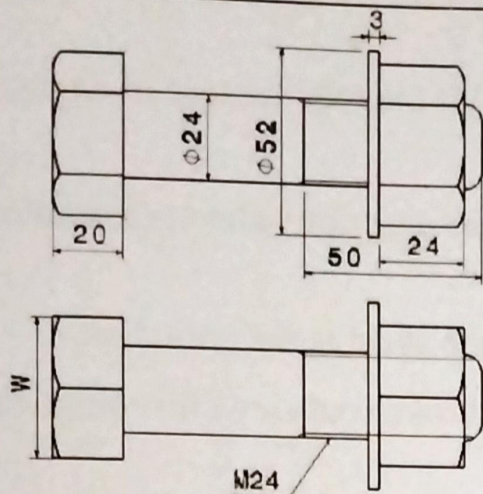
2D DRAWING



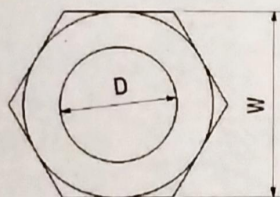
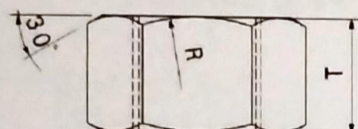
Options to be used: Line, Circle, Fillet, Mirror, Trim



EXERCISE

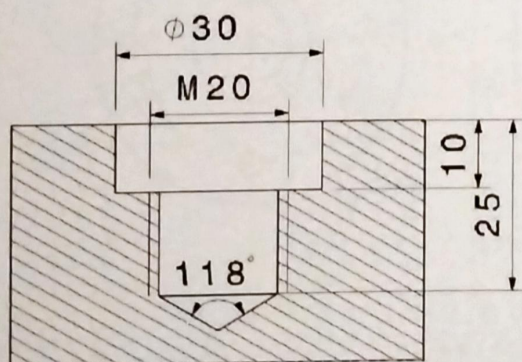


Hexagonal Bolt

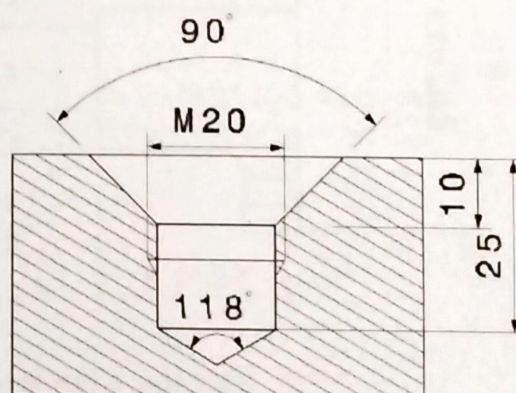


Hexagonal Nut

NO.	DESCRIPTION	DIMENSIONS
1	THICKNESS OF NUT, T	$T=D$
2	WIDTH ACROSS FLATS, W	$W=1.5D+3$
3	ANGLE OF CHAMFER	30°
4	RADIUS OF CHAMFER, R	$R=1.4D$ (APPROX.)



Counter Bore Hole



Counter sunk Hole

Options to be used: Line, Hexagon, Circle, Arc, Trim, Hatch

EXERCISE

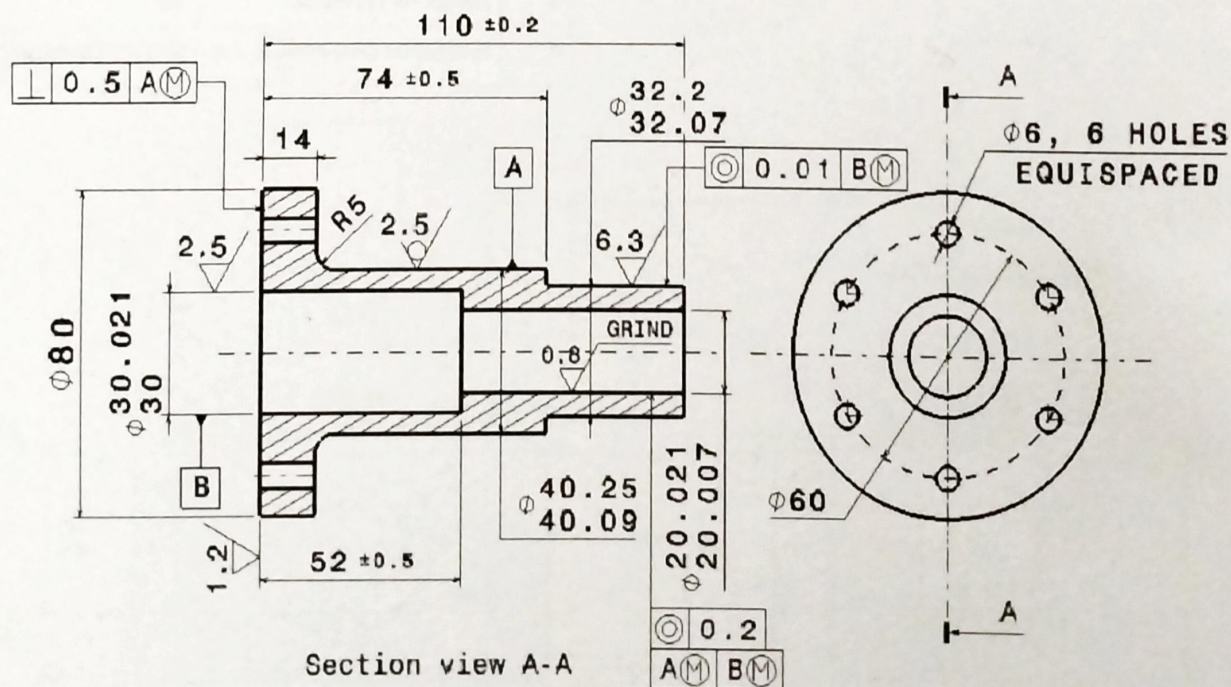
Drafting

- Preparation of complete design sheet to fulfil the requirement of engineer.

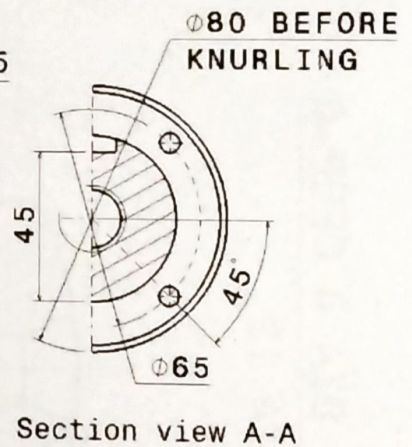
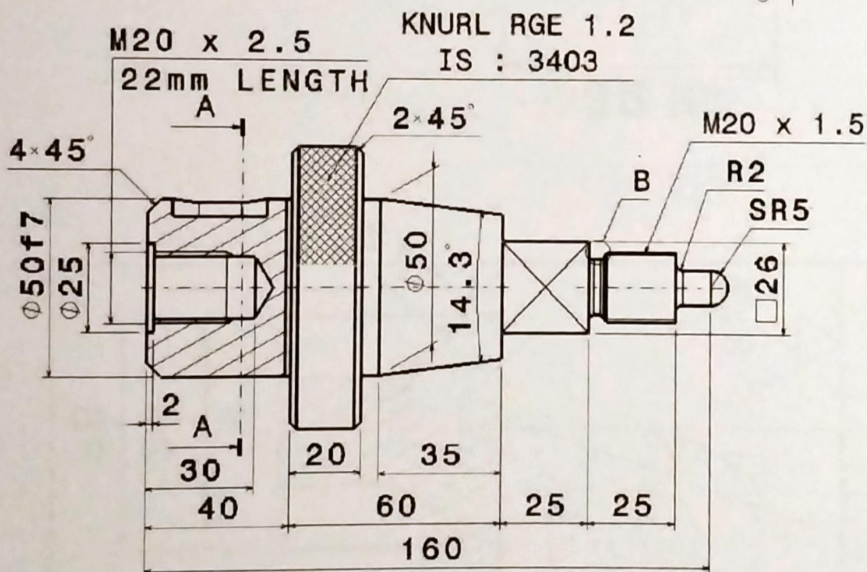
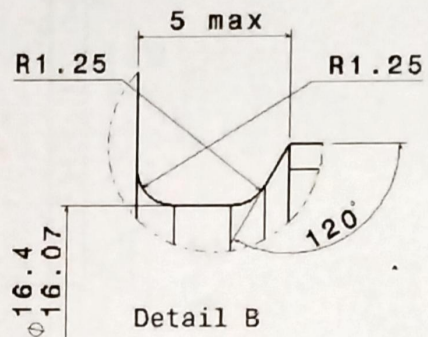
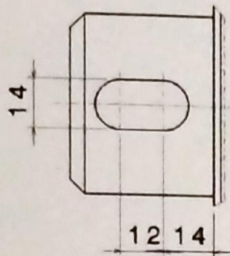
Drafting Procedure

- Maintain clarity by giving more symbols, less descriptive letters & minimize unnecessary dimensions.
- Use multiple sheets for defining views if one sheet is not sufficient.
- Create more sectional views, detail views & broken out views for complicated features.
- Don't display all hidden lines in views. Repeated hidden lines should be avoided.

Follow the rules of dimension & maintain proper drawing standard



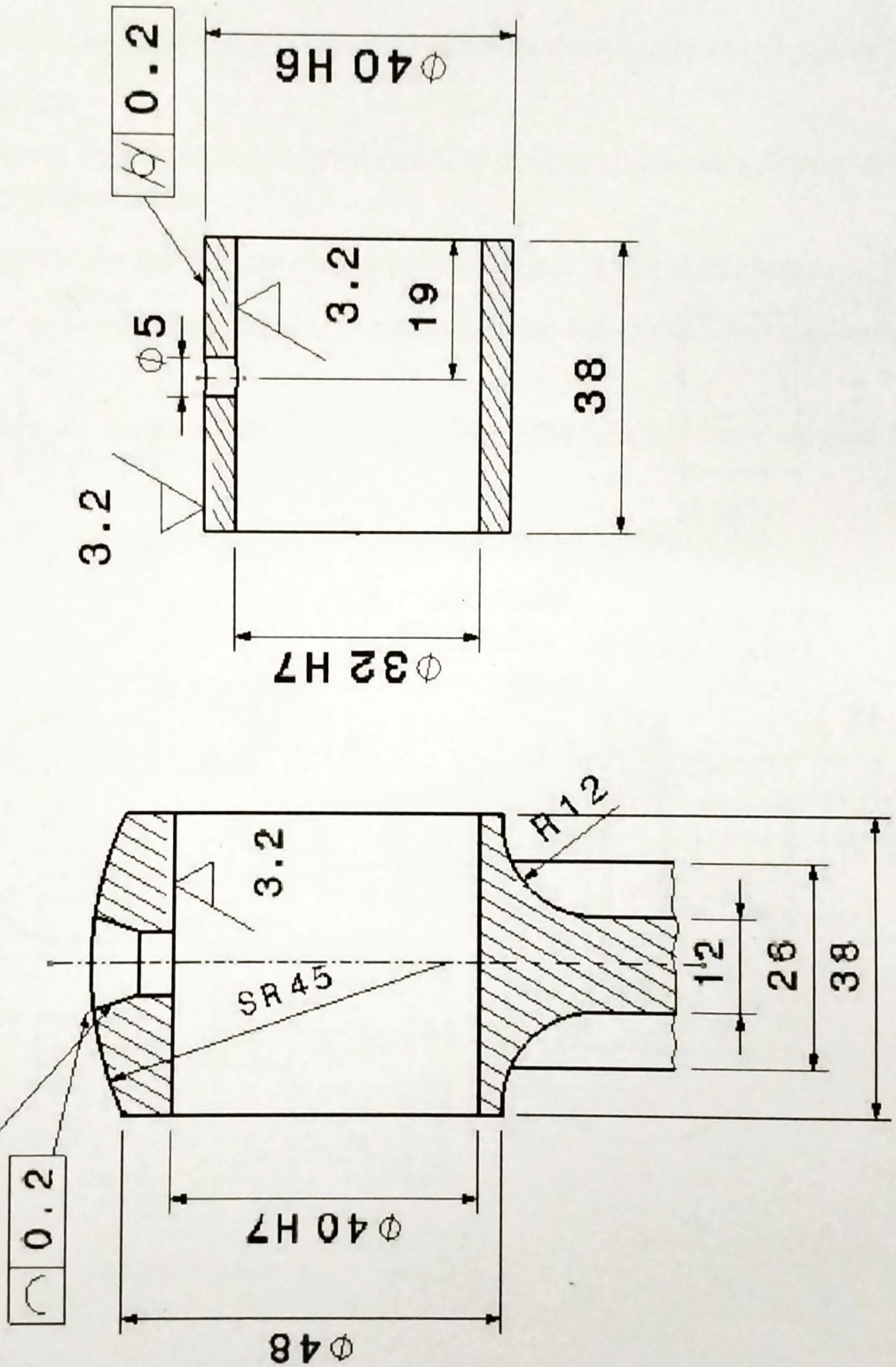
EXERCISE



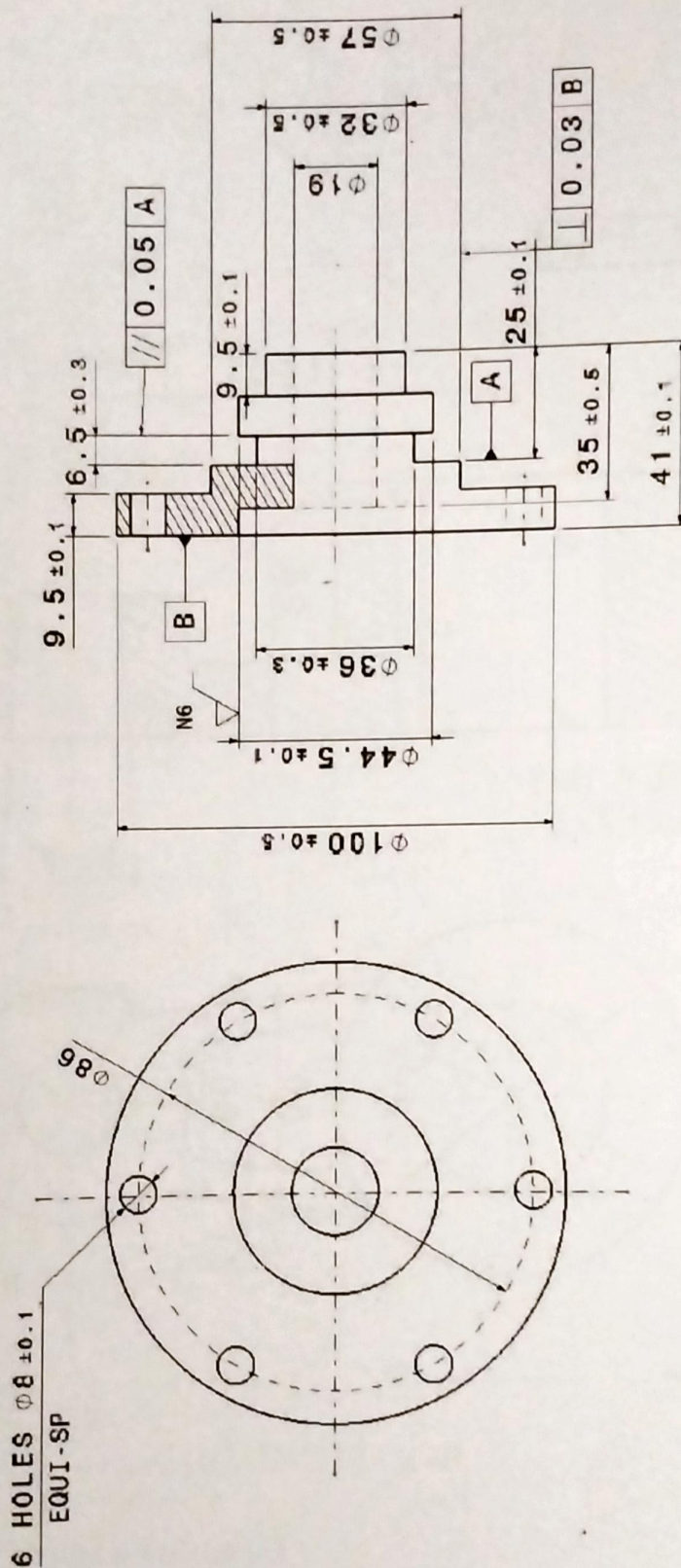
EXERCISE

OIL HOLE DIA 8 DEEP 6

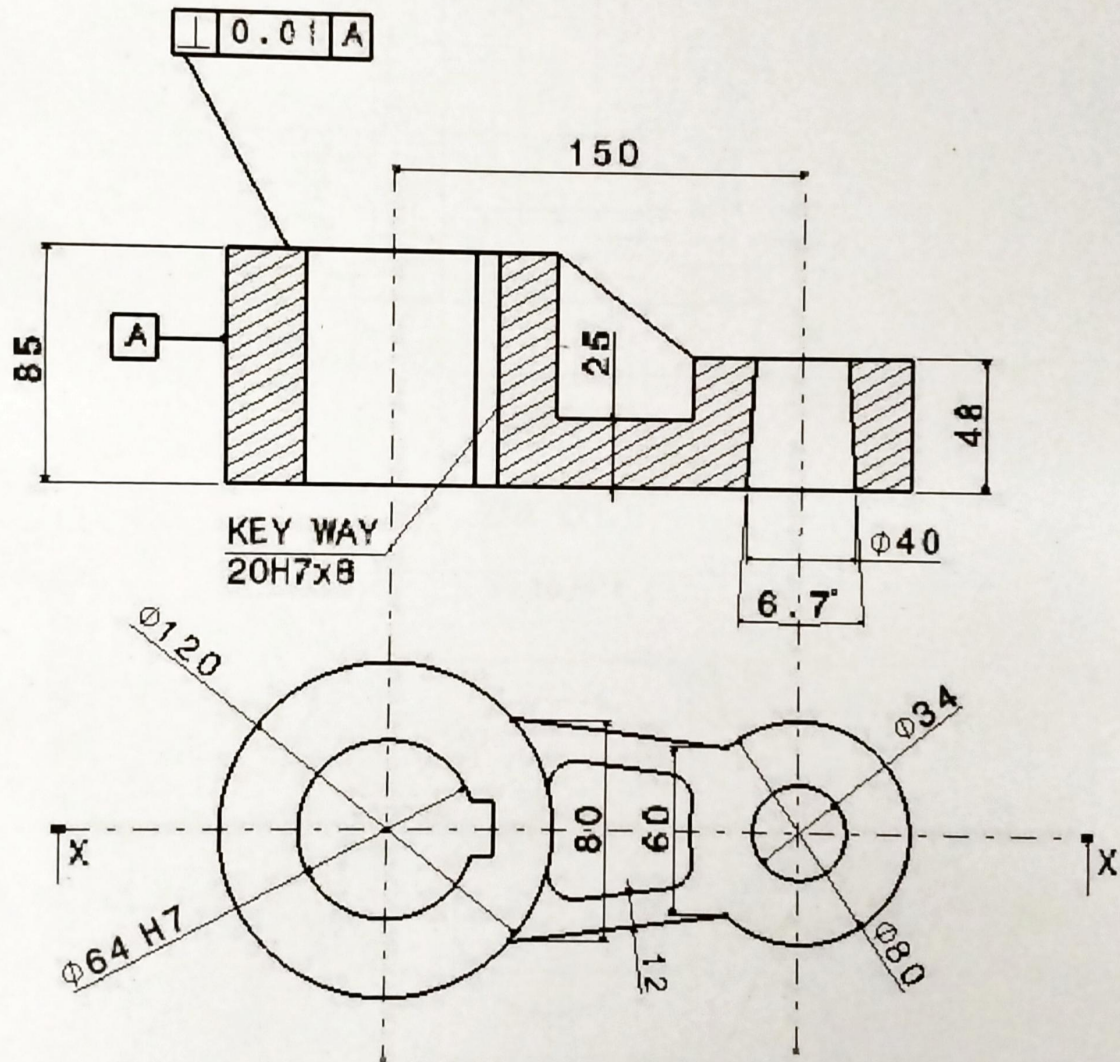
CSK DIA 12



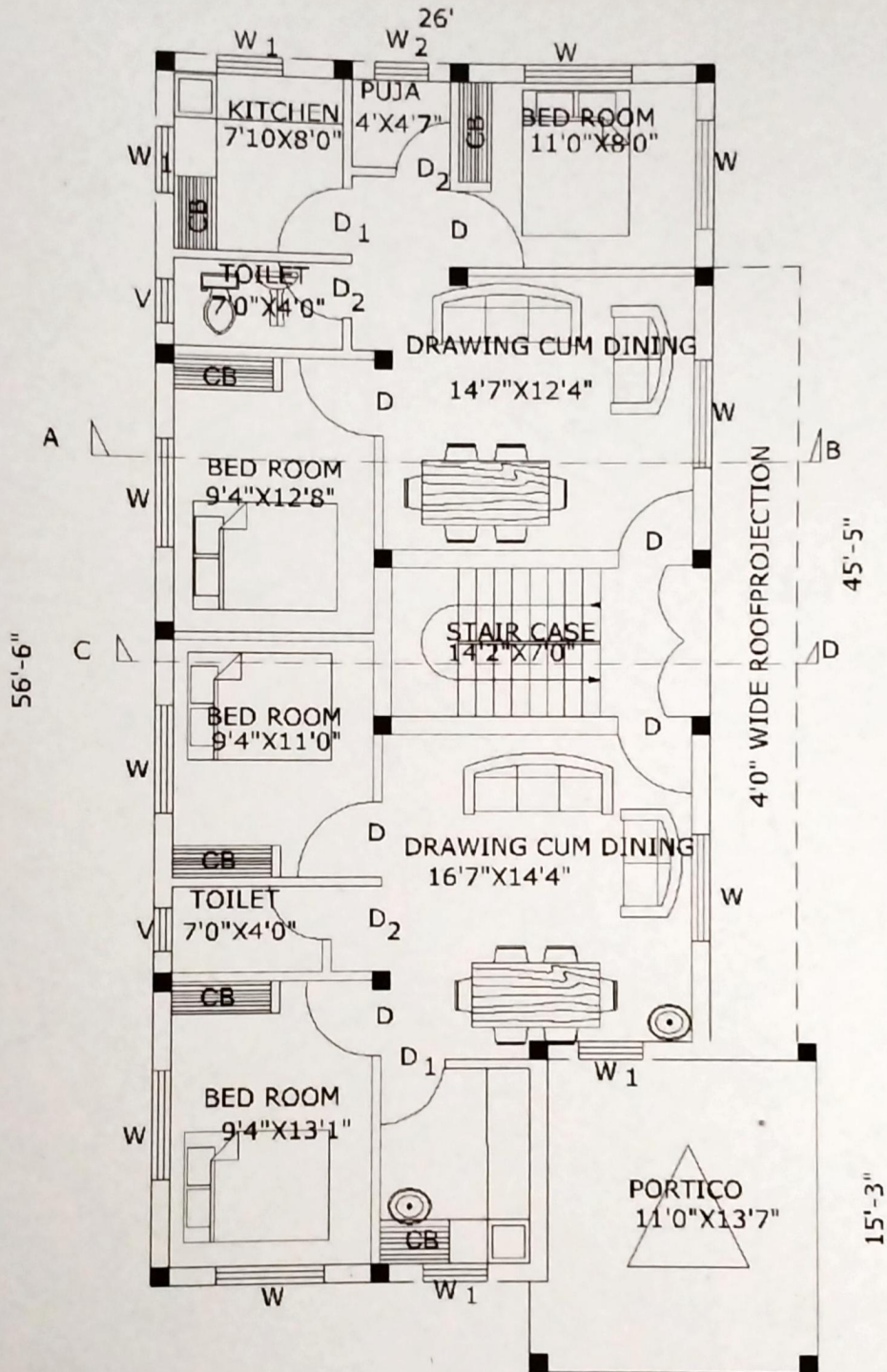
EXERCISE



EXERCISE



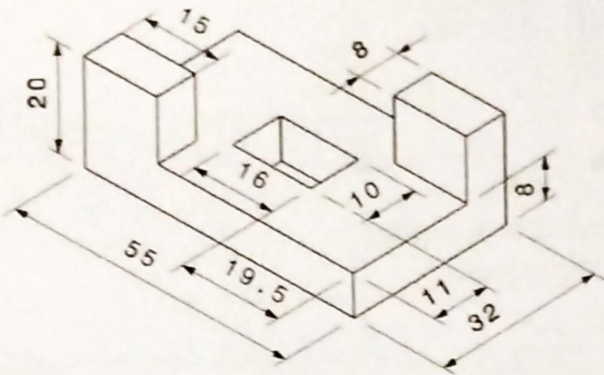
BUILDING DRAWING



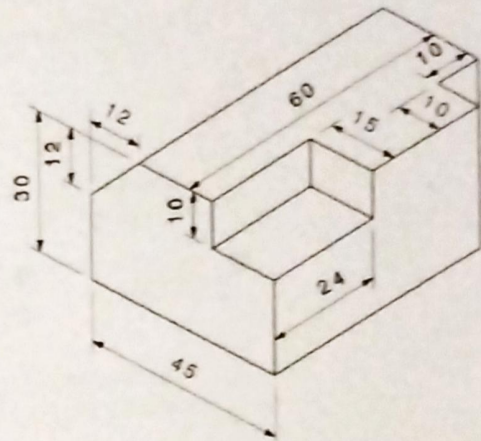
GROUND FLOOR

N.B. - Change the Unit to Imperial

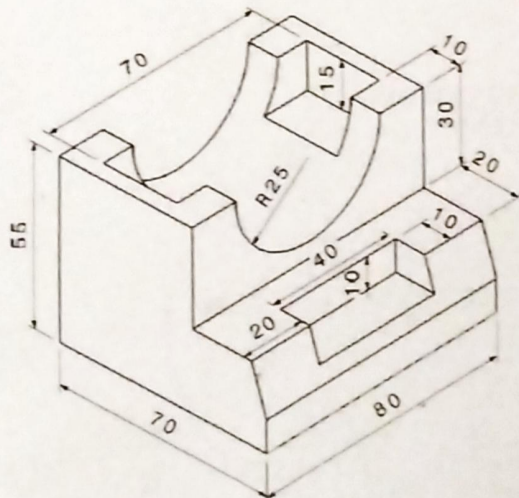
3D MODELLING



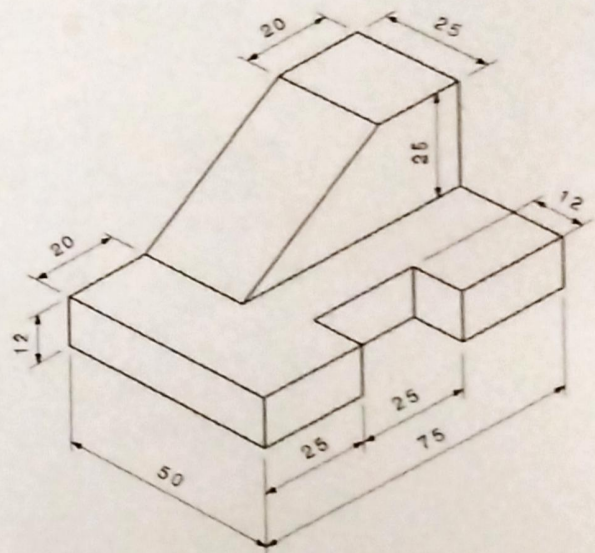
EX 1



EX 2



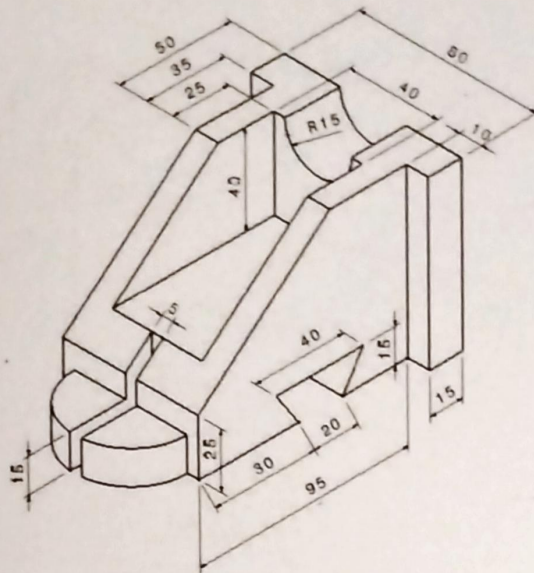
EX 3



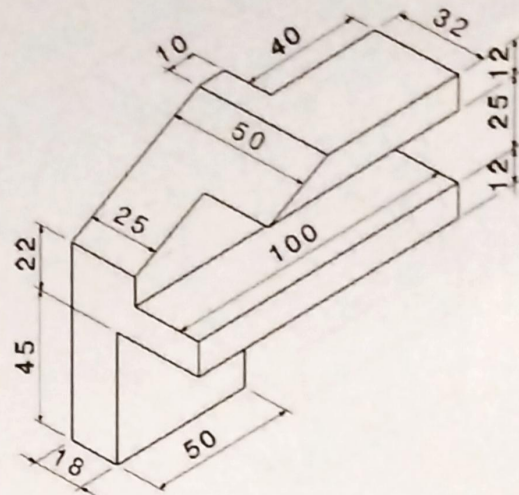
EX 4

Options to be used: Extrude, DUCS, Subtraction, Union

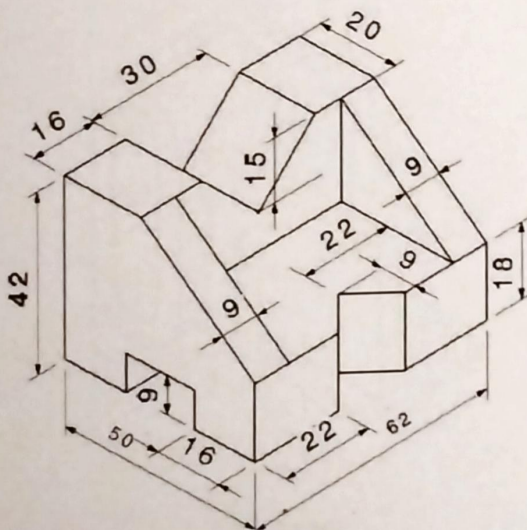
3D MODELLING



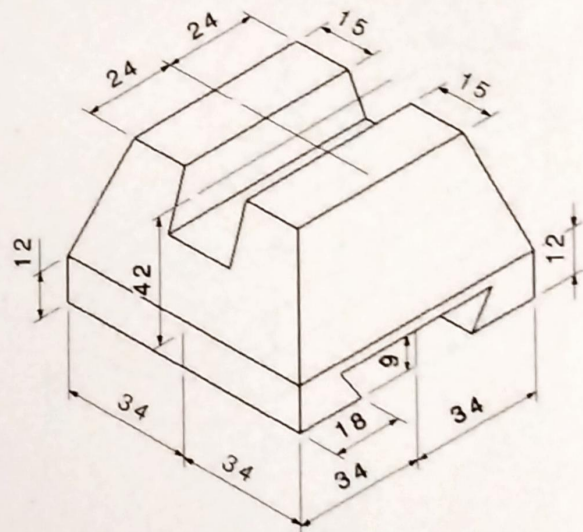
EX 5



EX 6



EX 7

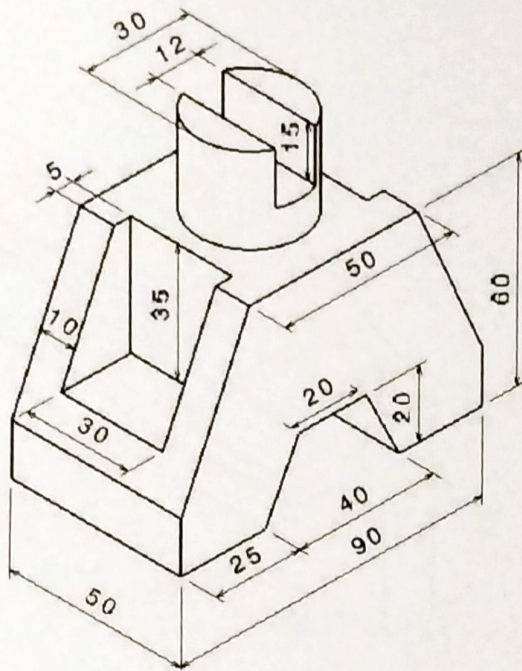


EX 8

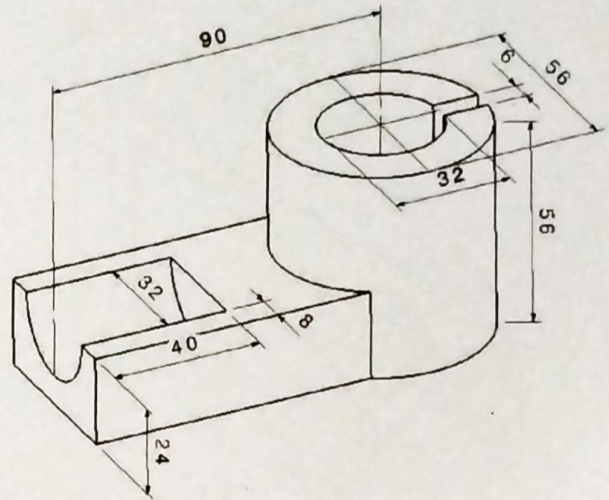
Options to be used: Extrude, DUCS, Subtraction, Union, 3D Chamfer



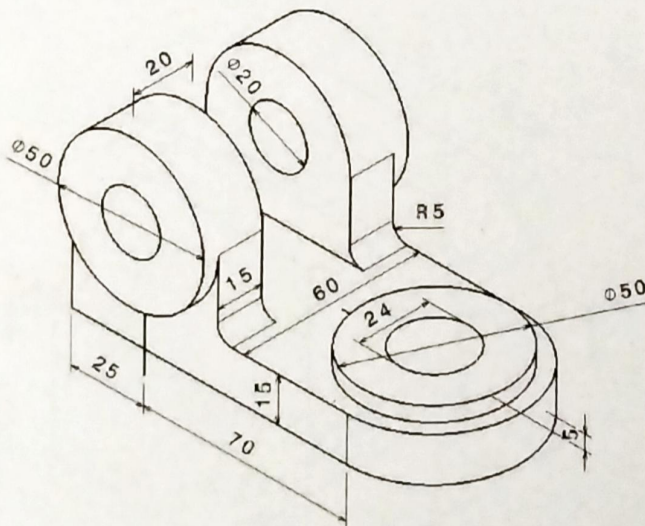
3D MODELLING



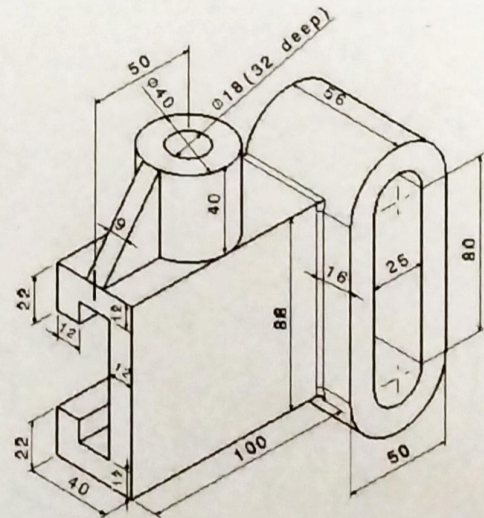
EX 9



EX 10



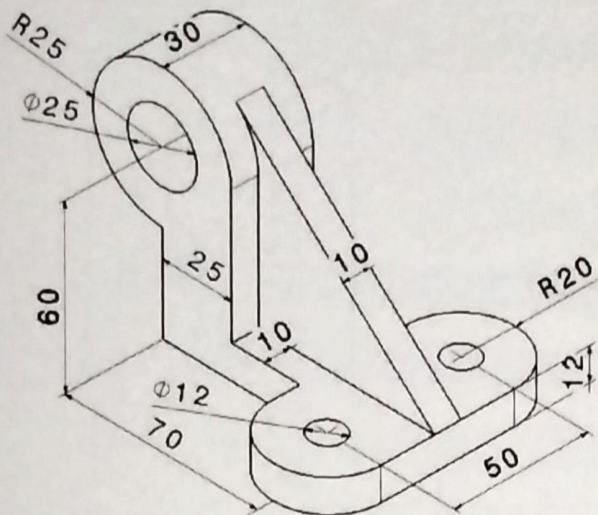
EX 11



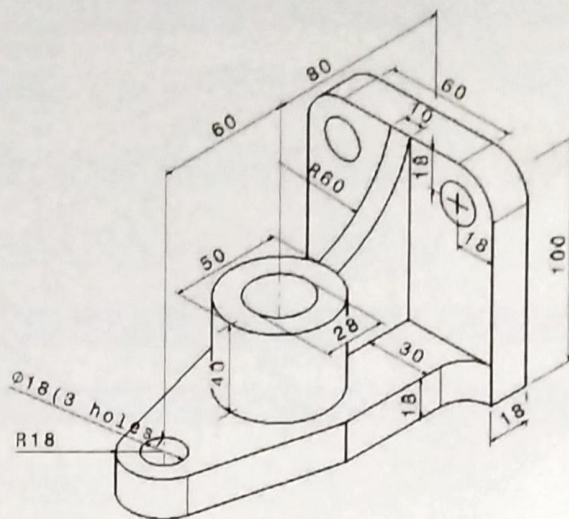
EX 12

Options to be used: Extrude, DUCS, Subtraction, Union, 3D Fillet

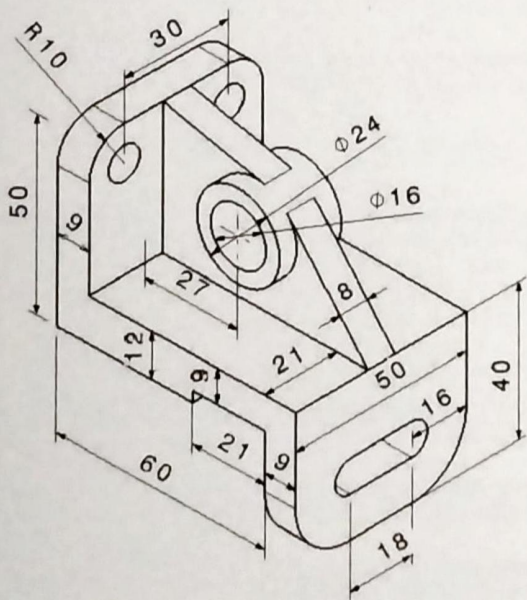
3D MODELLING



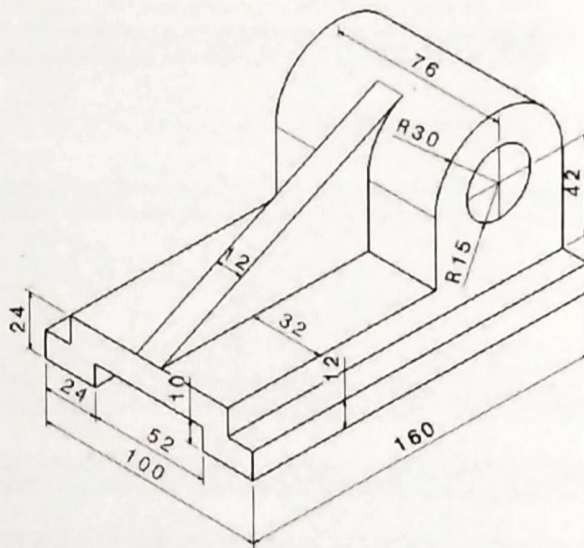
EX 13



EX 14



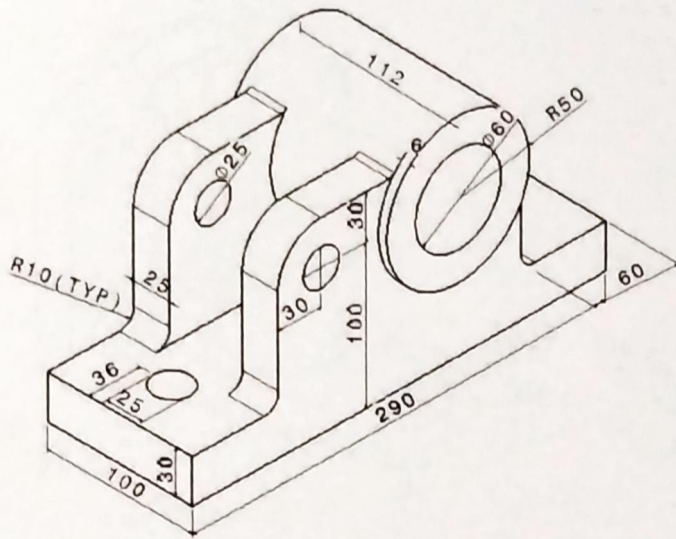
EX 15



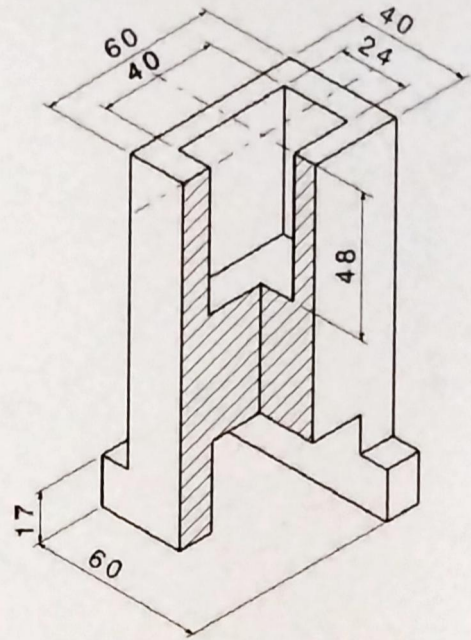
EX 16

Options to be used: Extrude, DUCS, Subtraction, Union, 3D Fillet

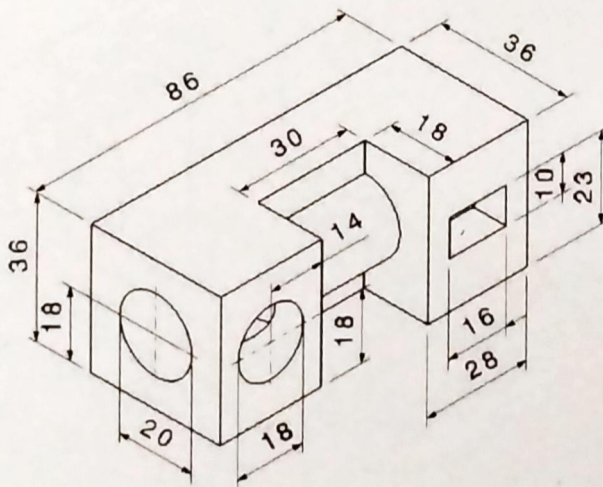
3D MODELLING



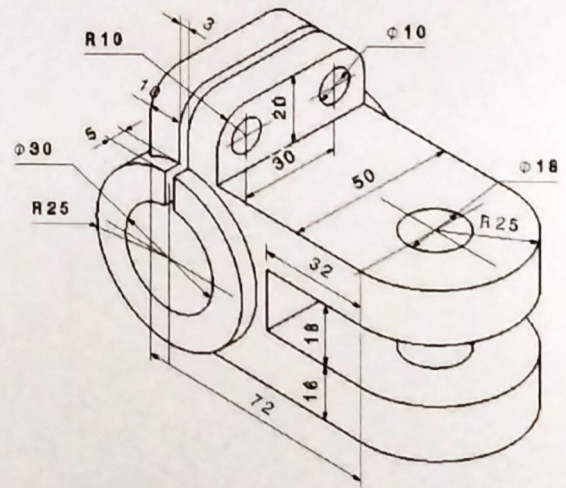
EX 17



EX 18



EX 19

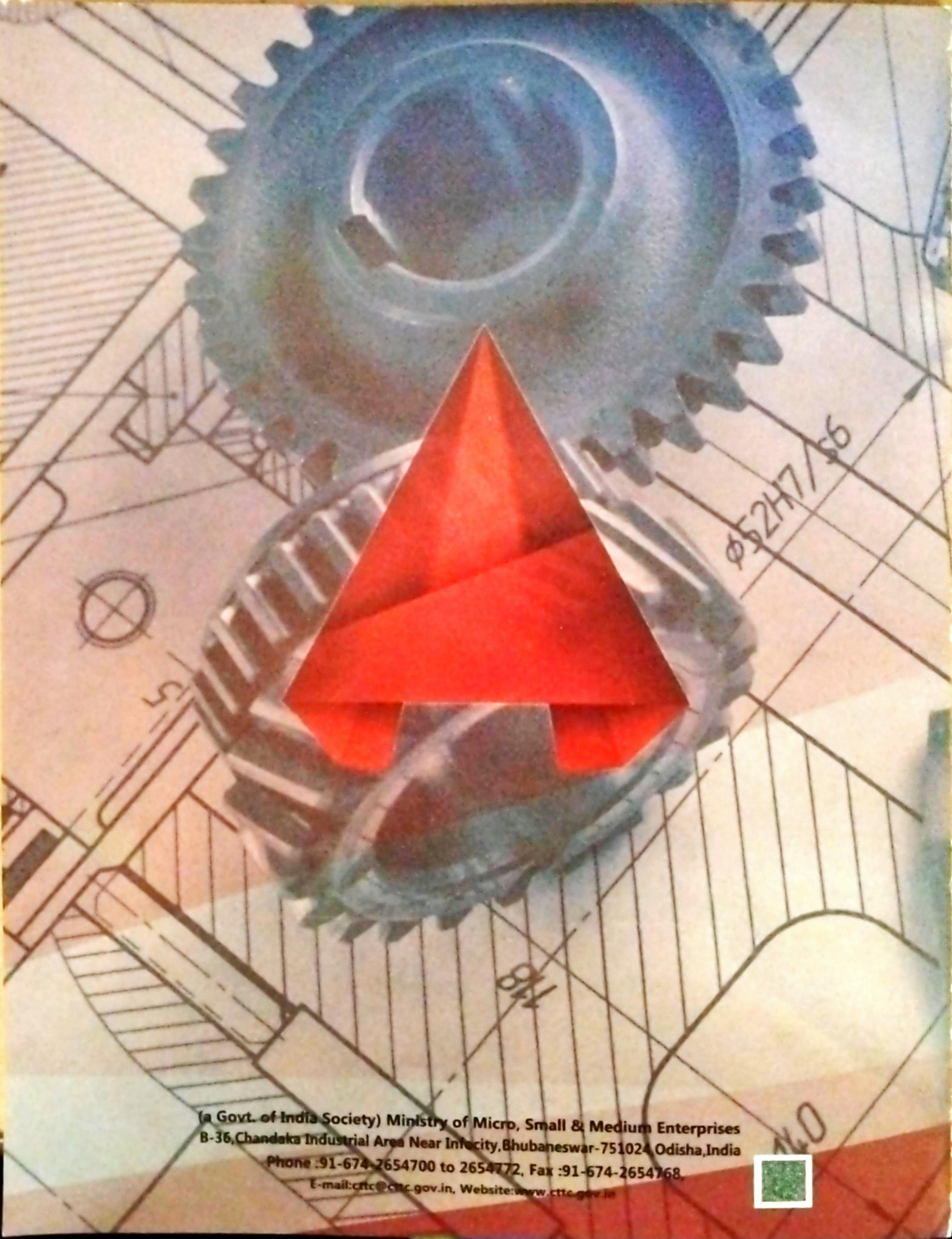


EX 20

Options to be used: Extrude, DUCS, Subtraction, Union, 3D Fillet

NSQF COMPLIED LONG TERM COURSES

COURSE NAME		DURATION	HOURS	COURSE FEE
COURSES FOR 10TH PASS OUT				
Diploma in Tool & Die Making	DTDM	4 Year		₹ 38,000/- (per Year)
Diploma in Mechantronics	DIM	3 Year		₹ 38,000/- (per Year)
ITI Machinist	ITIM	2 Year		₹ 28,000/- (per Year)
ITI Fitter (Course at Kalinga Nagar Extention Centre)	ITIF	2 Year		₹ 28,000/- (per Year)
ITI Electrician (Course at Kalinga Nagar Extention Centre)	ITIE	2 Year		₹ 28,000/- (per Year)
Condensed Course in Tool & Die Making	CTDM	1 Year	1560 Hrs.	₹ 66,000/-
Certificate Course in CNC Turning & Milling	CCTM	1 Year	1560 Hrs.	₹ 32,000/-
COURSES FOR UNDER MATRIC				
Certificate Course in Machine Operation	CCMO	1 Year	1560 Hrs.	₹ 18,000/-
COURSES FOR ITI STUDENTS				
Certificate Course in Advance Machining	CCAM	1 Year	1920 Hrs.	₹ 32,000/-
Advance Certificate Course in Machine Maintenance	ACCMM	1 Year	1560 Hrs.	₹ 32,000/-
Advance Certificate Course in CNC Machining	ACCCM	1 Year	1560 Hrs.	₹ 34,000/-
Advance Certificate Course in Welding Technology	ACCWT	1 Year	1560 Hrs.	₹ 50,000/-
Certificate Course in Machining	CCM	6 Months	780 Hrs.	₹ 22,000/-
Certificate Course in Fitting & Rigging	CCFR	6 Months	780 Hrs.	₹ 32,000/-
COURSES FOR DIPLOMA IN MECHANICAL ENGG. OR EQUIVALENT				
Post Diploma in Tool & Die Making	PDTDM	1 Year	1560 Hrs.	₹ 54,000/-
Post Diploma in CAD/CAM	PDCC	1 Year	1560 Hrs.	₹ 54,000/-
Advance Diploma in CNC Programming Techniques & Practice	ADCNC	6 Months	900 Hrs.	₹ 34,000/-
COURSES FOR DEGREE IN MECHANICAL ENGG. OR EQUIVALENT				
Post Graduate Diploma in Tool Design & CAD/ CAM	PGDTD	1 Year	2340 Hrs.	₹ 60,000/-
Post Graduate in Aerospace Manufacturing	PGAM	1 Year	1560 Hrs.	₹ 60,000/-
Master Certificate course in CAD / CAM	MCC	6 Months	780 Hrs.	₹ 36,000/-
COURSES FOR DIPLOMA IN ELECTRICAL/ELECTRONICS ENGG. OR EQUIVALENT				
Advanced Diploma in Machine Maintenance & Automation	ADMMA	6 Months	780 Hrs.	₹ 34,000/-
Advanced Embedded Technology	AET	6 Months	780 Hrs.	₹ 34,000/-
Certificate Course in Electrical Equipment Repair & Maintenance	CCERM	6 Months	1560 Hrs.	₹ 34,000/-
Post Diploma in Industrial Automation & Robotics	PDIAR	1 Year	780 Hrs.	₹ 60,000/-
COURSES FOR DEGREE IN ELECTRICAL/ELECTRONICS ENGG. OR EQUIVALENT				
Master Certificate Course in Automation & Process Control	MCCAPC	6 Months	780 Hrs.	₹ 36,000/-
COURSES FOR DIPLOMA IN MECHANICAL/ ELECTRICAL/ELECTRONICS ENGG. OR EQUIVALENT				
Post Diploma In Mechatronics	PDIM	1 Year	1560 Hrs.	₹ 54,000/-
COURSES FOR DIPLOMA/DEGREE IN CIVIL ENGG.				
Post Diploma in Structural Analysis & Project Management	PDSPM	1 Year	1560 Hrs.	₹ 54,000/-
Advance Diploma in Structural Design & Analysis	ADSDA	6 Months	780 Hrs.	₹ 34,000/-
COURSES FOR ANY GRADUATE				
Advance Certificate Course in Inspection & Quality Control	ACCIQ	6 Months	780 Hrs.	₹ 22,000/-
Advance Diploma in Computer Hardware & Networking Management	ADCHNM	6 Months	780 Hrs.	₹ 34,000/-
Advanced Certificate Course in Software Application	ACCSA	6 Months	780 Hrs.	₹ 22,000/-



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